SERVICE MANUAL

FISHER

MT-6225

Linear Motor
Direct Drive Turntable

(EUROPE)

The first name in high fidelity

Nominal Specifications for Information Only

TURNTABLE	MT6225
Motor	Linear Direct
Drive	Direct
Wow and Flutter (WRMS)	0.03 %
Rumble	−70 dB
Speed Variation	±0.5 %
Speed Control Range	±3 %
Tracking Force Range	0.6 - 3.5 grams
Platter Diameter	12-15/16"
Platter Weight	2.2 lbs.
Strobo Light	Yes
Record Speed Selector	33/45 rpm
Auto Function Stop Reject	 Yes Yes
Manual Function Start Stop	 Yes Yes
Tone Arm Data Resonance Balance Adjustment Effective Length Shape	 <10 Hz Counter-Weight 222 mm S-Form
Bearing-Type Horizontal Friction Sensitivity	 Thrust 0.15 gram
Vertical Friction Sensitivity	Pivot 0.2 gram
Max. Tracking Error	±1.5°
Anti Skate Control	Adjustable
Cueing	Viscous Damped
GENERAL Power Requirements	 110/220 V AC ±10 %
Dimensions	17-3/4"x6"x14-1/4"
Weight	17.7 lbs.

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INTRODUCTION

In the past a variety of turntable platter drive systems have been employed. All these systems involved deceleration because the motor speed was always considerably higher than the playing speed required for the turntable platter. A complicated system of worm gears, idler wheels, pulleys and belts had to be used to reduce the speed.

The disadvantage of any coupling (transmission) between the motor and the turntable platter is that it does add a certain amount of wow, flutter and rumble. If a direct coupling exists between the motor shaft and the turntable platter, if the motor shaft becomes in fact the drive shaft, the platter speed is the motor speed and that can be maintained within very narrow tolerances, and almost complete elimination of vibrations can be achieved.

The FISHER MT-6225 direct drive turntable employs a very unique linear motor drive system, very different from some of the other direct-drive turntables on today's market.

If a comparison is made, the most obvious difference is the utmost simplicity of the FISHER MT-6225, and since this is an electromechanical device, simplicity translates into long-term stability and reliability.

Some of the most outstanding features of this unique drive system are that the turntable platter is the rotor of the motor, that there are no electrical connections to the rotor, that the rotor has no armature windings and that all the complicated electronic circuitry is in a stationary (nonmoving) position on a single PC board mounted into the turntable base.

The linear motor used in the MT-6225 moves and accelerates upon the application of a 3-phase drive signal at a frequency of either 33-1/3 Hz or 45 Hz to 3 stator field coils. The 3-phase drive signal produces a progressively changing magnetic field in the stator windings. This magnetic field will attract and repel (or pull and push) the respective magnetic poles of the rotor magnets and thus cause the platter to rotate. Inertia causes the rotor to turn past the exact position of North Pole and South Pole alignment, and at this instant the magnetic field advances or rotates, thus pulling and pushing the rotor again in the same direction.

One other significant difference between the FISHER MT-6225 and other turntables is the number of magnetic rotor poles used. The motor speed is directly related to the number of poles in a motor, which can be calculated by using the following equation.

$$RPM = \frac{120 \times f}{p}$$

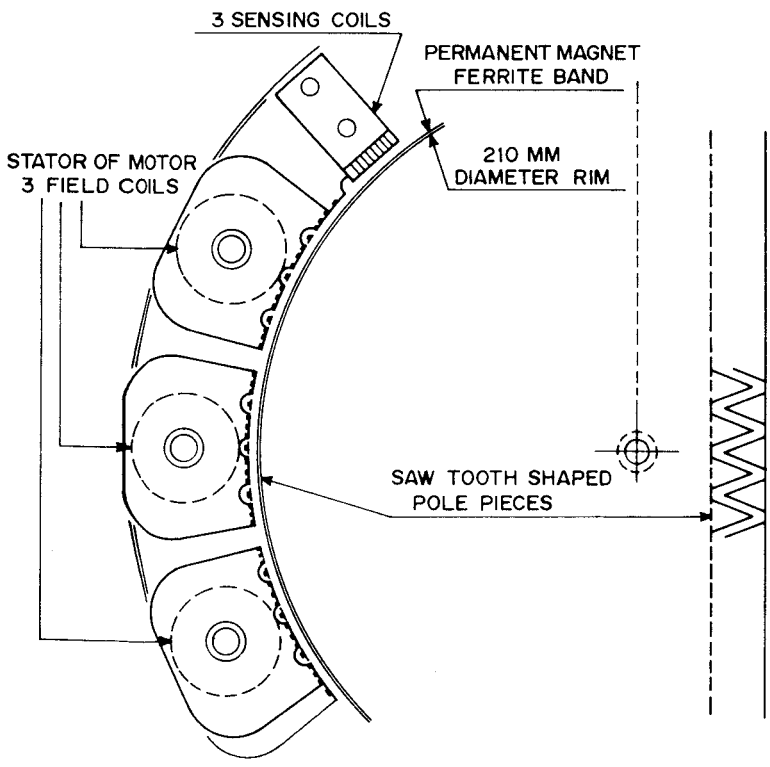
RPM = Revolutions/minute
f = supply frequency
p = number of poles
120 = constant

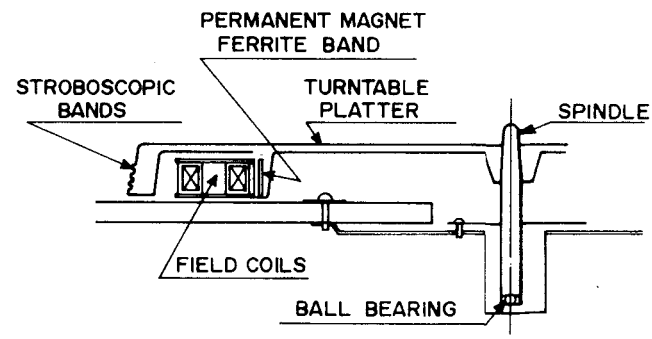
DRIVE SYSTEM

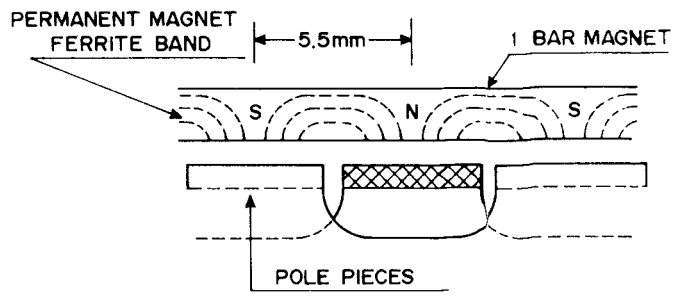
The turntable platter is the rotating part (the rotor) of the motor. It is mounted on a spindle and the spindle is mounted into a precision bearing. There are no other mechanically moving parts connected to the drive system. The only exception is the shutoff mechanism which engages only in the reject mode or at the end of a record.

A band 14 mm wide and 2mm thick, made of rubber ferrite mateial, is bonded to a 210 mm diameter rim on the inside of the turntable platter. 120 individual poles, 60 bar magnets, are printed onto the ferrite band through permanent magnetization at equal intervals of 5.5 mm around the entire circumference. The magnetic flux density of the rotor magnets is approximately 600 gauss.

The stator of the motor consists of three field coils connected in a three-phase star configuration, their respective sawtooth-shaped pole pieces, and of three sensing coils needed to produce the 120° 3-phase drive signal. The field coils are physically located under the platter on one side of the turntable base in a circular pattern facing the permanent magnet ferrite band on the rotor. The physical gap between the pole pieces and the rotor magnets is 1 mm, and the mechanical arrangement is such that the 3 field coils with their pole pieces, subdivided into 25 sawtooth-shaped sections with a mechanical separation of 3° 15′ for each, are always directly opposite a rotor section that contains 25 of the 120 magnetic poles. Only 81.25° of the total circular area is occupied by the stator. This is sufficient to develop a starting torque of 600 gr cm and for the rotor to reach the operational speed of 33-1/3 rpm after approximately 1 second.


3 SENSING COILS
PERMANENT MAGNET FERRITE BAND
STATOR OF MOTOR 3 FIELD COILS
210 MM DIAMETER RIM
SAW TOOTH SHAPED POLE PIECES



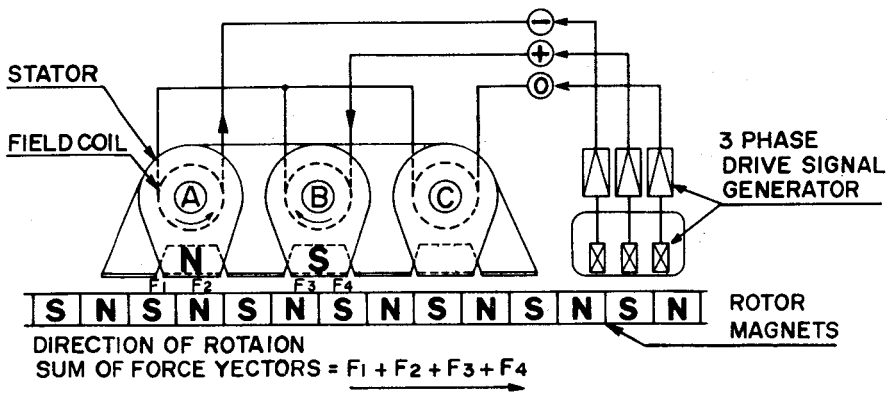


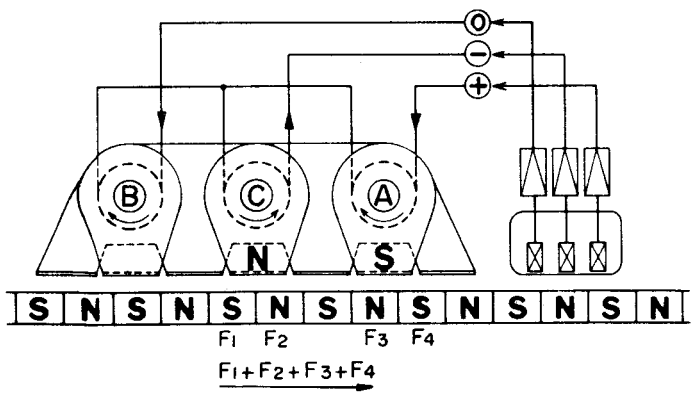
DRIVE SYSTEM

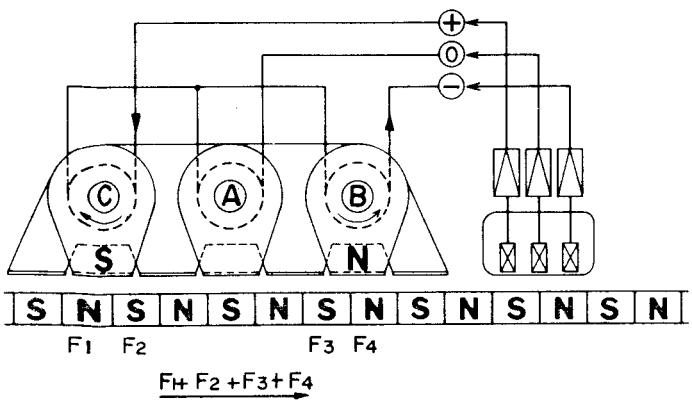
According to the above, a 30 pole motor connected to a 33-1/3 Hz supply would turn at a speed of 133-1/3 rpm. A 120 pole motor will turn at 33-1/3 rpm.

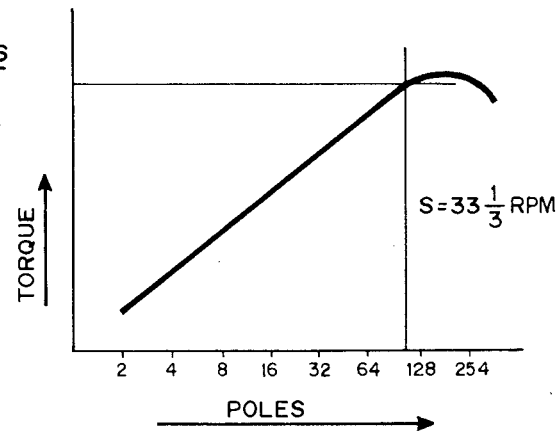
As the number of poles is increased, the speed of the motor is electrically reduced and the torque of the motor increased, provided the same electrical power source is used to drive the motor. The turntable has its own regulated power supply for the electronic circuits and a servo locked frequency generator to power the linear motor. This makes it completely immune to power line voltage variations.

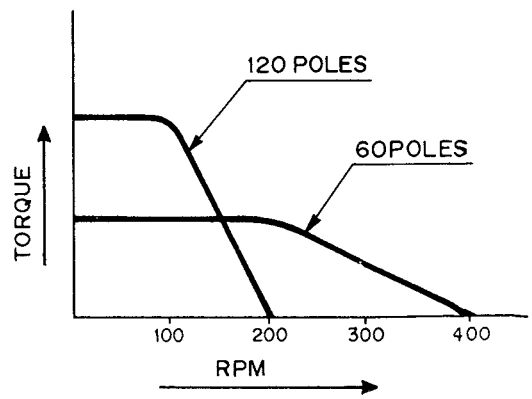
BLOCK DIAGRAM
LINEAR MOTOR











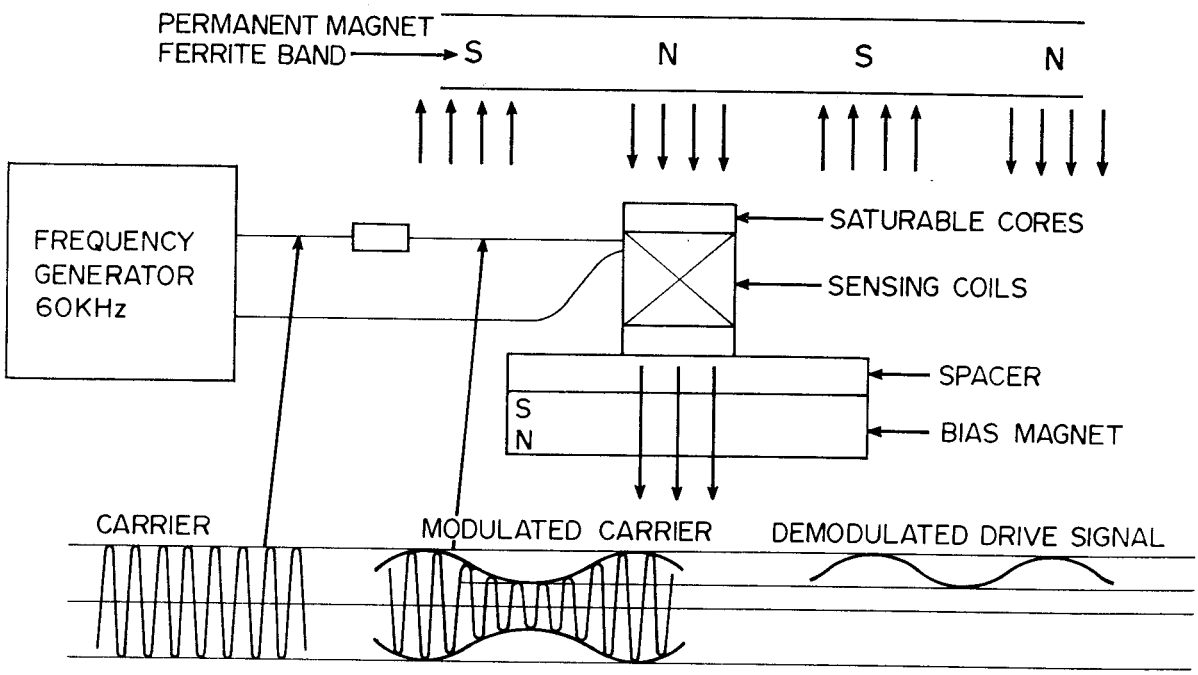
DRIVE SIGNAL GENERATION

A 60 kHz sinewave signal is generated by an LC oscillator circuit. The 60 kHz signal is then fed to the 3 sensing coils. The inductance of the 3 sensing coils is varied through the rotation of the rotor magnets passing the sensing coils. The nominal value of the inductance of the sensing coils is approximately 1 mH; but since the coils are physically located in a very strong rotating magnetic field, magnetic saturation of the cores in the sensing coils occurs, and the effective inductance alternates between the nominal value and less than 10 % of the nominal value. The amplitude of the 60 kHz signal current flowing through the sensing coils is also varied at a frequency equal to the rotational speed of the platter. This phenomenon of variable inductance is exploited and very effectively used to AM modulate the 60 kHz carrier of the frequency generator. The AM modulation is adjusted to approximately 50 %.

There is a spacing of 3.8 mm between the 3 sensing coils. This arrangement will produce a 120° phase difference between the three modulating signals at the coils.

The three AM modulated signals are then demodulated, and the recovered 3-phase sinewave signal at a frequency of 33-1/3 Hz for 33-1/3 rpm and 45 Hz for 45 rpm is the actual drive signal for the linear motor.

The drive signal is further processed by 3 constant current drive amplifiers, consisting of 3 operational amplifiers (IC's) and 3 complementary symmetry output stages. The amplifier output signals are then connected to the 3 stator field coils.



TURN ON

The turntable is turned on by a microswitch connected mechanically to the shutoff mechanism of the tonearm. At the very first instant after turn on, the output signal of the 60 kHz frequency generator is unmodulated and its amplitude is approximately 6 V pp. This carrier signal is rectified and fed through the 3 amplifiers to the 3 stator field coils. As soon as the platter has started to turn, the servo control circuits will reduce the carrier amplitude to approximately 1 V pp which will at this time also contain the amplitude modulation produced by the sensor coils. As soon as the correct speed is reached, the magnetic field produced by the field coils will run synchronous with the rotor magnets.

SERVO CONTROL

The drive signal for the servo control circuit is derived directly from the field coils. A separate speed detection device like a tachometer coil or a Hall element is not employed, and the problems such an element may contribute, such as temperature drift, etc., are thus eliminated.

Through the rotation of the platter, the rotor magnets pass the stator field coils and an opposing voltage is generated in the stator field coils with a frequency equal to the rotational speed of the turntable platter, 33-1/3 Hz (LP's) and 45 Hz (45 rpm records).

This signal from 2 of the field coils is the drive signal for the servo amplifier, which consists of a high gain differential amplifier, an amplitude limiter which makes the circuit immune to amplitude variations of the control signal, and a pulse shaping circuit. The servo signal is then further processed into a sawtooth-shaped signal by a frequency to voltage converter which has an output proportional to the speed of the turntable.

$$f = Pn \times S \times \frac{1}{60} \qquad f = S$$

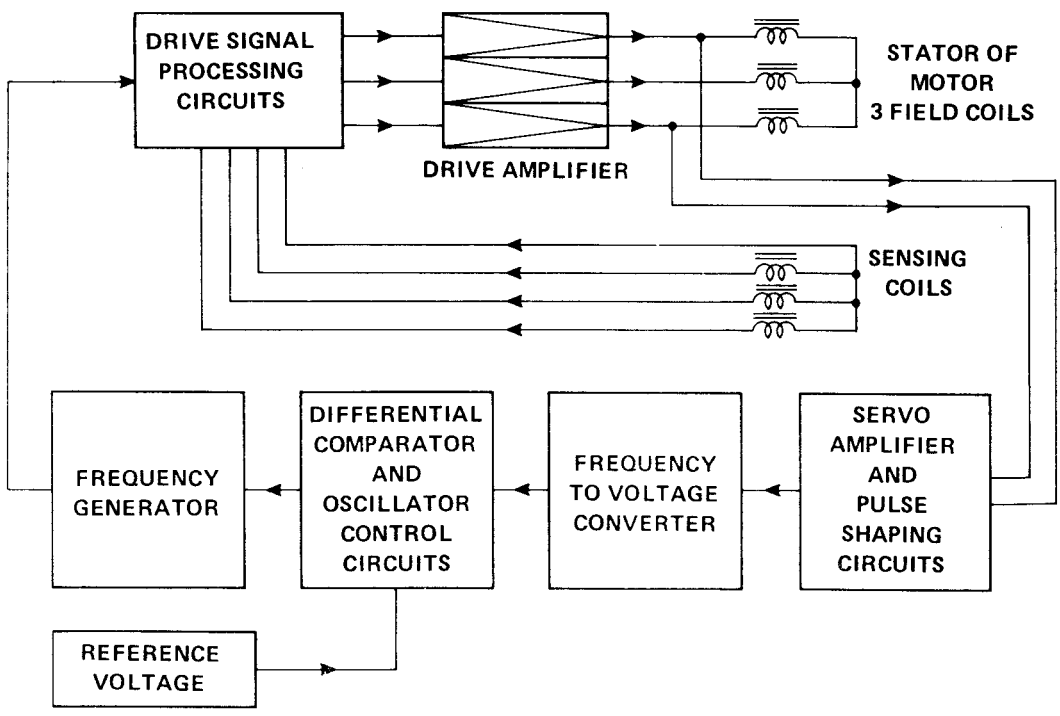
f = supply frequency
Pn = number of pole pairs
s = speed rpm

The servo voltage is then connected to one side of a differential comparator.

The other half of the differential comparator is connected to a DC reference signal from a regulated power supply. The DC reference signal is internally set so that it coincides with the correct speed when the pitch control is set at center. The reference for the correct speed is obtained through a neon lamp connected to the AC power line which illuminates the respective stroboscopic bands at the turntable platter outside rim. The differential amplifier compares the sawtooth-shaped signal with the DC reference signal.

The servo loop is closed by connecting the output of the differential amplifier through a low pass filter and a regulator transistor to the 60 kHz oscillator circuit. The regulator transistor controls the oscillator supply voltage and, as a result, the amplitude of the 60 kHz carrier. Any change in the carrier amplitude of the frequency generator will affect the amplitude of the motor drive signal. Since the drive signals for the servo circuit are obtained by monitoring the actual speed of the turntable platter, an instantaneous and precise servo action is maintained at all times.

BLOCK DIAGRAM



ELECTRICAL ADJUSTMENTS

Although the three adjustments below are preformed at the factory be sure to recheck each adjustment whenever the printed circuit boards are removed and repaired.

1. ROTATION ADJUSTMENT

Place the unit horizontally and set the pitch control knobs (VR301, VR302) to their mechanical center positions.

B. Set the speed selector to 33-1/3 RPM and adjust VR102 for zero deviation by observing the stroboscope, then set the speed selector to 45 RPM and adjust VR101 for zero deviation by observing the stroboscope.

2. DC BALANCE ADJUSTMENT

A. Remove the turntable. (The unit can be placed vertically.)

B. Connect a DC VTVM between test points (TP-1) and terminal A2, and subsequently between test point (TP-1) and terminal B2. Adjust first VR103 and ten VR104 for minimum DC voltage, the value measured should be less than 10 mV DC.

3. SERVO GAIN ADJUSTMENT

The gain of the servo circuit is adjusted by VR105. If the gain is too high, the rotational speed takes too long to stabilize. If the gain is too low, the rotational speed will not be stable under load conditions.

A. Install the turntable platter and place the unit horizontally.

B. Connect the vertical input of an oscilloscope to test point (TP-2) and terminal (E).

C. Set the oscilloscope vertical amplifier sensitivity for 0.2 V/cm. Set the horizontal sweep time to 0.5 sec./cm.

D. With the turntable switched off, a point will travel from left to right on your oscilloscope screen.

E. Switch the turntable on and observe a vertical line traveling across the oscilloscope screen. The vertical line amplitude (height) should stabilize after 3.5 seconds ±0.5 seconds, (7 cm. horizontal travel on your oscilloscope screen). See FIGURE 1.

F. If the vertical line takes either less or more than 3.5 seconds ±0.5 seconds, very carefully adjust VR 105.

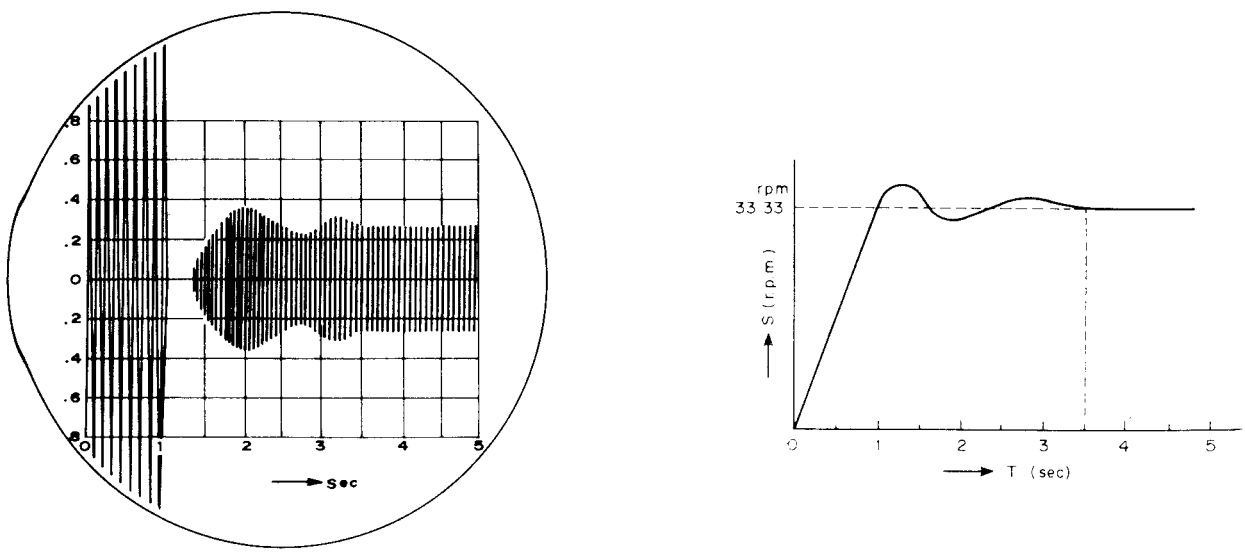
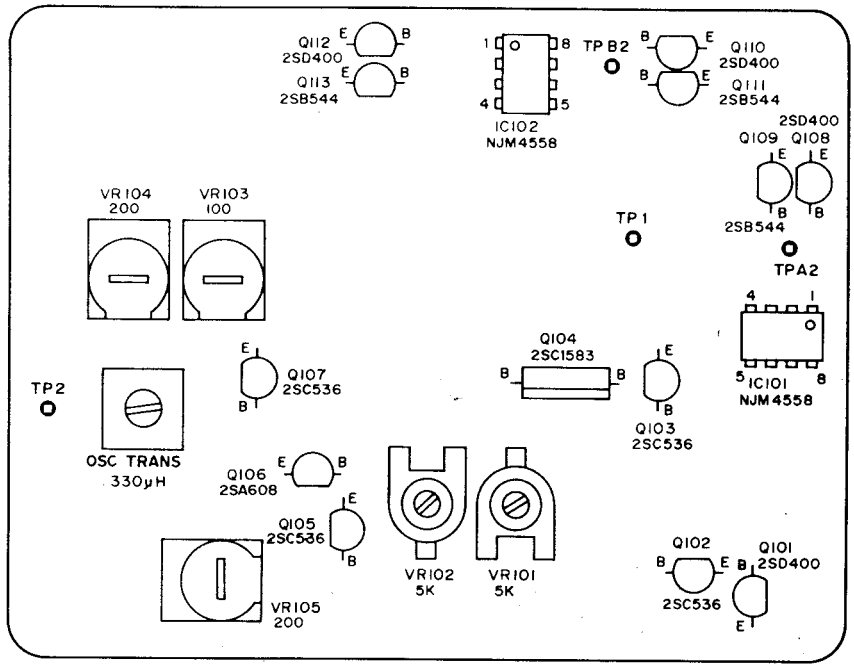


Fig. 1

MOTOR BOARD LAYOUT



MECHANICAL ADJUSTMENTS

PICK-UP ARM HEIGHT ADJUSTMENT
Loosen the pick-up arm height adjusting screw (60) and adjust the height by sliding the support arm (57) and secure the screw.

PICK-UP RAISING POSITION ADJUSTMENT (Return point)
Turn screw (A) clockwise to move outwards, and counterclockwise to move inwards.

MOUNTING CARTRIDGE

1. Carefully mount cartridge according to instructions given by the cartridge manufacturer. Do not tighten mounting screws as yet.
2. Connect the four colored wires contained in the cartridge shell to the cartridge terminals. It is important that connections are made correctly. That is, colors of wires and cartridge terminals must be matched.
   White = Left output
   Blue = Left ground
   Red = Right output
   Green = Right ground
3. Plug cartridge shell into tone arm and tighten cartridge shell ring by turning it counterclockwise. (Fig. 2)
4. Move the tone arm over the turntable shaft and move the carridge back or forth to obtain a space of 21/32" between turntable shaft and stylus tip. (Fig. 3)
   Fix cartridge in this location by tightening mounting screws.

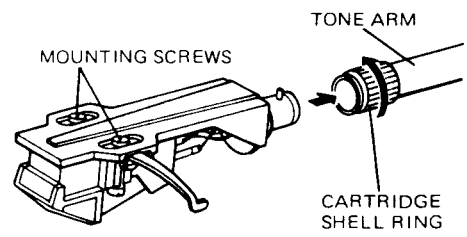


Fig. 2

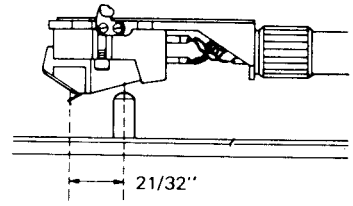


Fig. 3

PARTS LIST

MOTOR PCB Assy
131 0 4001 81100

Ref. No.	Parts Number	Description
	4 2589 20900	OSC Coil 330 μH
VR01,02	4 2229 24380	Variable Resistor 5k
VR03,04 05	4 2229 26070	Variable Resistor 200
	CAPACITORS	
C01	C1HFAM473A--	Mylar 0.047 μF 50V ±20 %
C02,03	C1HFAM333A--	Mylar 0.033 μF 50V ±20 %
C04	C1CRB-107A--	Electrolytic 100 μF 16V
C05	C1HFAM104A--	Mylar 0.1 μF 50V ±20 %
C06,07	C1ARB-225A--	Electrolytic 2.2 μF 10V
C08	C1ARB-475A--	Electrolytic 4.7 μF 10V
C09	C1CRB-475A--	Electrolytic 4.7 μF 16V
C10	C1HFAM222A--	Mylar 0.0022 μF 50V ±20 %
C11	C1HFAM223A--	Mylar 0.022 μF 50V ±20 %
C12,13 14	C1HFAM473A--	Mylar 0.047 μF 50V ±20 %
C15,16 17	C1HFAM333A--	Mylar 0.033 μF 50V ±20 %
C18	C1CRB-227A--	Electrolytic 220 μF 16V
C19	C1CRB-226A--	Electrolytic 22 μF 16V
	SEMICONDUCTORS	
D01	2025 3000 00910	Diode SZ-9
D02,03 07	2025 9530 44810	Diode DS-448
D04,05 06	2025 9110 18820	Diode IS-188FM1
IC01,02	IJJ-NJM4558D-	IC NJM4558D-E
Q01,08 10,12	2035 6900 40050	TR 2SD400E
Q02,03 05,07	2035 5000 53660	TR 2SC536
Q04	TMM-2SC1583-G	TR 2SC-1583G
Q06	2035 7200 60860	TR 2SA608F
Q09,11 13	2035 6860 54450	TR 2SB544E-MP

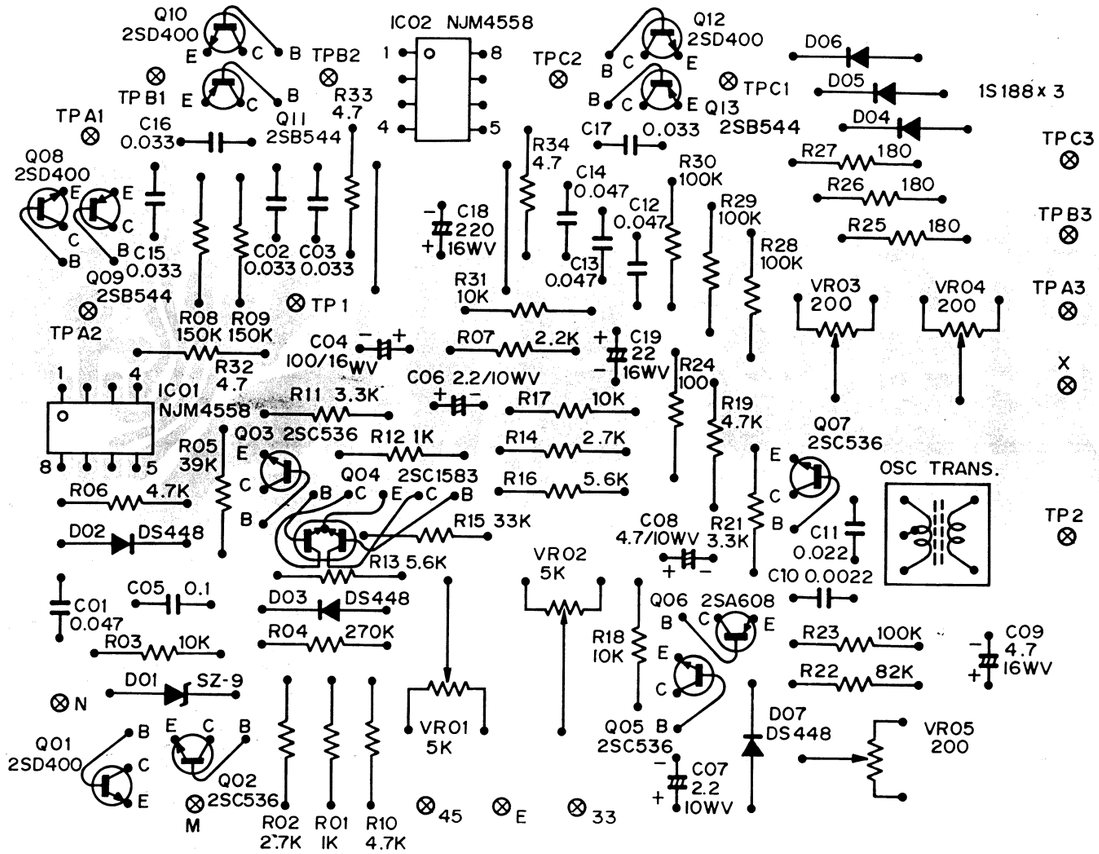
Ref. No.	Parts Number	Description
	RESISTORS	
R01	R2EDSJ102A	Carbon 1k 1/4W ± 5 %
R02	R2EDSJ272A	Carbon 2.7k 1/4W ± 5 %
R03	R2EDSJ103A	Carbon 10k 1/4W ± 5 %
R04	R2EDSJ274A	Carbon 270k 1/4W ± 5 %
R05	R2EDSJ393A	Carbon 39k 1/4W ± 5 %
R06	R2EDSJ472A	Carbon 4.7K 1/4W ± 5 %
R07	R2EDSJ222A	Carbon 2.2k 1/4W ± 5 %
R08,09	R2EDSJ154A	Carbon 150k 1/4W ± 5 %
R10	R2EDSJ472A	Carbon 4.7k 1/4W ± 5 %
R11	R2EDSJ332A	Carbon 3.3k 1/4W ± 5 %
R12	R2EDSJ102A	Carbon 1k 1/4W ± 5 %
R13	R2EDSJ562A	Carbon 5.6k 1/4W ± 5 %
R14	R2EDSJ272A	Carbon 2.7k 1/4W ± 5 %
R15	R2EDSJ333A	Carbon 33k 1/4W ± 5 %
R16	R2EDSJ562A	Carbon 5.6k 1/4W ± 5 %
R17,18	R2EDSJ103A	Carbon 10K 1/4W ± 5 %
R19	R2EDSJ472A	Carbon 4.7k 1/4W ± 5 %
R21	R2EDSJ332A	Carbon 3.3k 1/4W ± 5 %
R22	R2EDSJ823A	Carbon 82k 1/4W ± 5 %
R23	R2EDSJ104A	Carbon 100k 1/4W ± 5 %
R24	R2EDSJ101A	Carbon 100 1/4W ± 5 %
R25,26 27	R2EDSJ181A	Carbon 180 1/4W ± 5 %
R28,29 30	R2EDSJ104A	Carbon 100k 1/4W ± 5 %
R31	R2EDSJ103A	Carbon 10k 1/4W ± 5 %
R32,33 34	R2EDSJ4R7A	Carbon 4.7 1/4W ± 5 %

POWER SUPPLY PCB Assy
131 0 4001 87400

Ref. No.	Parts Number	Description
	4 2349 20960	Fuse 0.2A Slow Blow
	4 2349 20310	Fuse 0.5A Slow Blow
	4 2359 23080	Socket
	4 2379 21930	Terminal 1P
	CAPACITORS	
C01	C2EHRM223A	Metalized Paper 0.022 μF 250V ±20 %
C02	C1ERT-477A--	Electrolytic 470 μF 25V
C03,04 05,06	C2HYDP103A--	Ceramic 0.01 μF 500V +100,–0%
	SEMICONDUCTOR	
D01	DDD-S1RBA20--	Diode Bridge S1RBA20
	RESISTOR	
R01	R3AXP5822A	Oxide Metal Film 8.2k 1W ±5 %

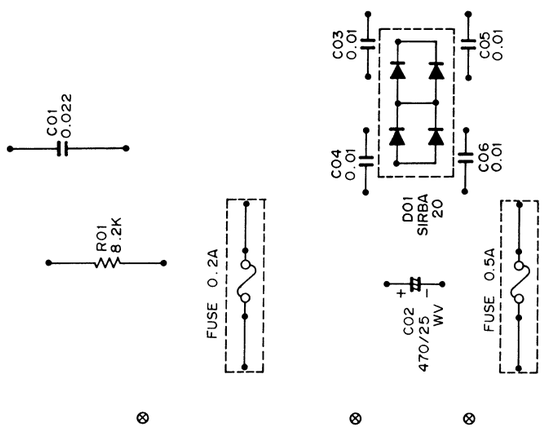
MOTOR P.C.BOARD

(BOTTOM VIEW)

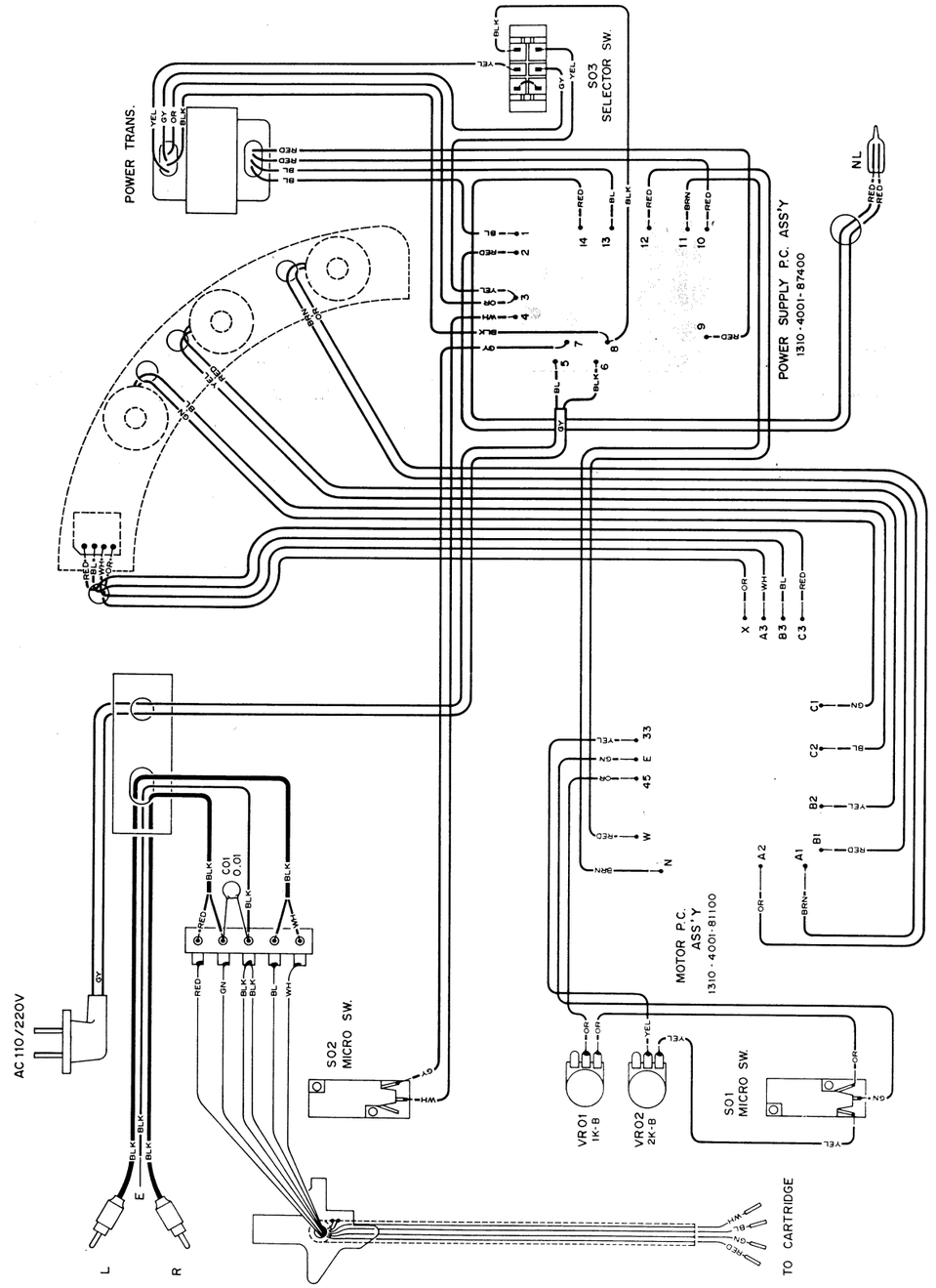


POWER SUPPLY P.C.BOARD

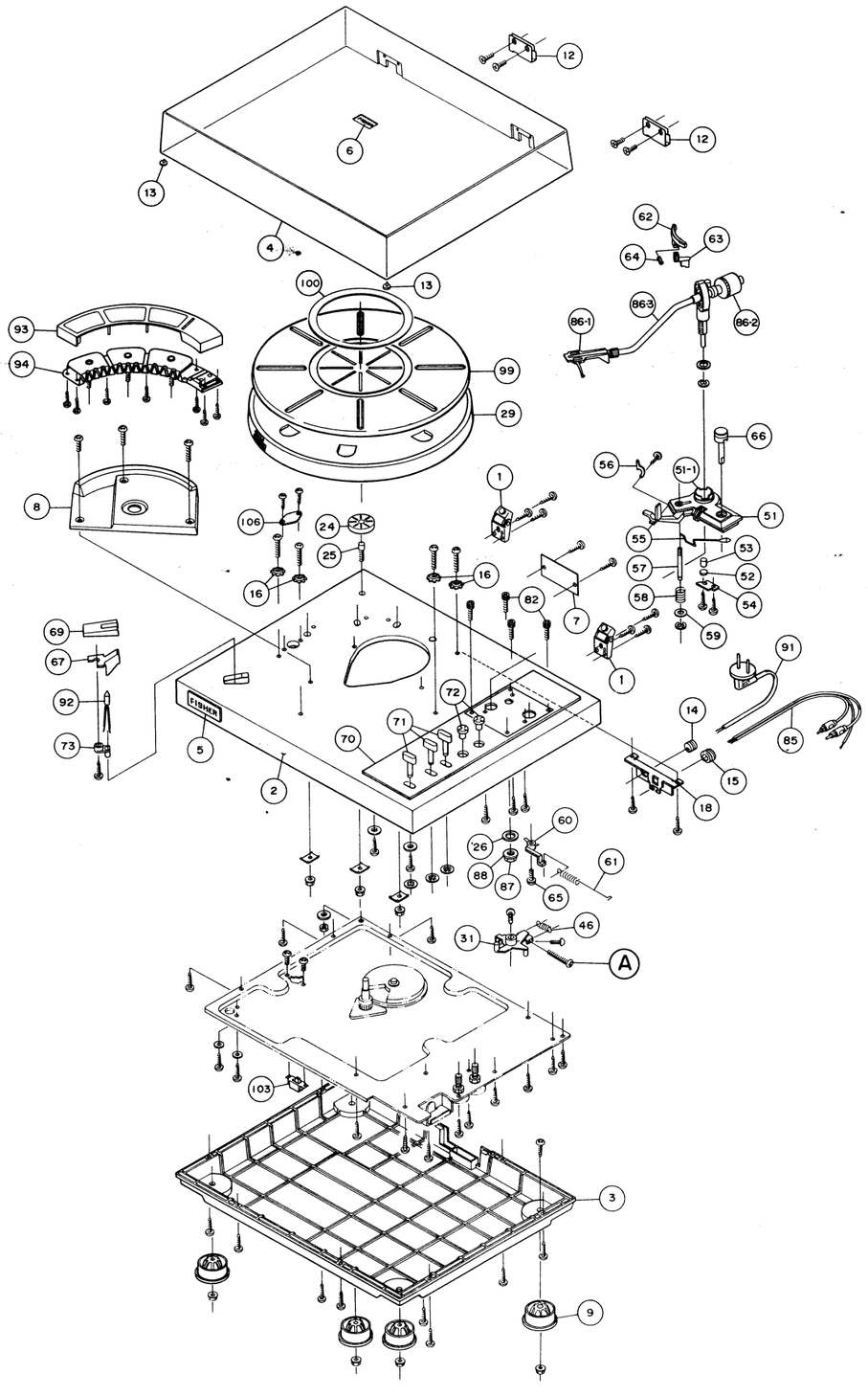
(BOTTOM VIEW)



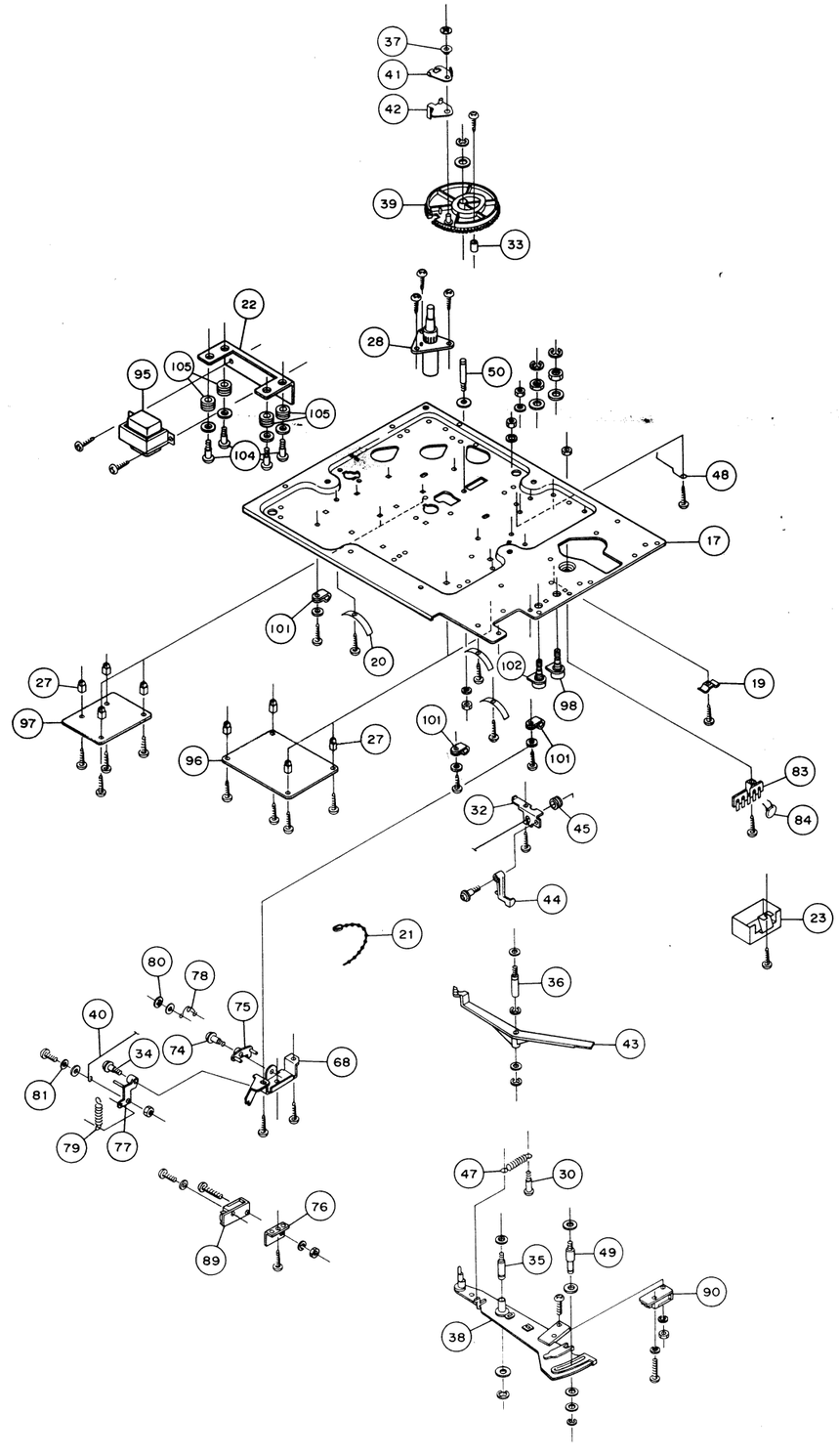
POINT TO POINT WIRING DIAGRAM



EXPLODED VIEW OF TURNTABLE(1)



EXPLODED VIEW OF TURNTABLE(2)



PARTS LIST

Ref.No.	Parts No.	Description
PACKING		
	131 6 1139 63903	Box Corrugate-EXP
	131 6 2119 01690	Bag Polyethylene—EXP (Lid)
	131 6 2119 01362	Bag Polyethylene-EXP (Set)
	131 6 2119 01470	Bag Polyethylene-EXP (Line Cord, Phono Cord)
	131 6 2519 01300	Bag Polyethylene IND (Weight)
	131 6 3009 19520	Pad (Bottom Turntable)
	131 6 3009 19980	Pad (Top)
	131 6 3009 23590	Pad (Right & Left)
	131 6 3069 15800	Patching Paper (Set)
ACCESSORIES		
	131 6 2519 07400	Bag Polyethylene IND
	131 6 2719 10801	Bag Fan
	131 6 4119 59901	Explanatory Booklet (English)
	131 6 4119 59931	Explanatory Booklet (French)
	131 6 4119 59921	Explanatory Booklet (German)
	131 6 4519 14700	Guarantee Card
	134 2 4202 11301	Nut M 2.6 — For using the Cartridge
	134 2 4201 11303	Screw M 2.6x11 — For using the Cartridge
	134 2 4203 01801	Washer 2.7x4.5x0.5t — For using the Cartridge
TURNTABLE		
*	101 3 1604 01203	Screw, BDG Head 4.0x12 ②－1
*	101 3 1604 01801	Screw, BDG Head 4.0x18 ②－2
1	131 0 2002 14203	Hinge Assy (Cabinet)
2	131 2 1101 35003	Cabinet (Metallic Gray)
	131 2 1101 35002	Cabinet (Wood Grain)
3	131 2 1105 19900	Plate Bottom
4	131 2 1107 19801	Lid
5	131 2 1301 16801	Badge
6	131 2 1310 22106	Name Plate (Lid)
7	131 2 1310 28703	Name Plate (Cabinet)
8	131 2 1410 17000	Cover
9	131 0 1003 12400	Leg Assy
12	131 2 2108 01400	Hinge (Lid)
13	131 2 2904 11900	Pad Lid
14	131 2 6111 14200	Bushing (Line Cord)
15	131 2 6111 15800	Bushing (Phono Cord)
*	131 2 4202 12904	Nut ⑨－4
*	106 3 1103 10802	Screw, Round Head Wood+ 3.1x8 ⑦－2
*	106 3 1103 11302	Screw, Round Head Wood+ 3.1x13 ①－1, ③－8, ⑱－2
*	101 3 1204 01005	Screw, Flat Head 4.0x10 ⑫－4
*	101 3 1504 01406	Screw, Truss Head 4.0x14 ⑨－4
*	101 3 1604 01801	Screw BDG Head 4.0x18 ⑰－4
*	106 3 1103 10801	Screw, Round Head Wood+ 3.1x8 ⑰－6
*	105 3 1204 00011	Washer, Spring 4.0 ⑰－4
16*	131 2 4203 18500	Washer
17*	134 2 2101 12601	Unit Plate
18*	131 2 3101 47601	Metal Mount
19*	131 2 3608 10300	Cramp Wire
20*	131 2 3608 12700	Cramp Wire
21*	131 2 3608 13200	Cramp Wire
22*	131 2 3617 16500	Metal Mount Trans
23*	131 2 6103 14700	Cover Shield
24	134 2 2901 10700	Adapter EP
25	134 2 2902 00305	Pin Adapter EP
26	134 2 5202 10900	Rubber Cushion

Ref.No.	Parts No.	Description
TURNTABLE		
27	131 2 3614 17101	Mount Pring C. Board
*	131 2 4202 12900	Flange Nut 3.0x10 ㉕－1
*	102 3 1203 00802	Screw, Pan Head Tapping 2 3.0x8 ⑲－1
*	102 3 1203 00602	Screw, Pan Head Tapping 2 3.0x6 ⑩－1
*	102 3 2203 00601	Screw, Button Head Tapping 3.0x6 ⑳－6, ㉓－1, ㉟－2, ㊼－4, ㊻－4
*	101 3 1103 00802	Screw, Pan Head 3.0x8 ㉒－2
*	105 3 1203 00002	Washer, Spring 3.0 ㉒－2
*	131 2 4203 83202	Washer, Plain 3.2x10x1.0 ㉒－2
28	134 0 9902 11103	Assembly Plan (Spindle T.T Assy)
29	134 2 6101 12000	Turntable
30	131 2 4108 10300	Spindle Pulley
31	134 0 6022 12010	Plate PU Fix Assy
32*	134 2 2403 17200	Angle Mount
33	134 2 2902 00304	Pin Adapter EP
34	134 2 4106 21800	Shaft (Reject Lever)
35	134 2 4106 21900	Shaft (Return Plate)
36	134 2 4106 22000	Shaft (Return Arm)
37	134 2 4107 12600	Collar
38	134 2 4108 20300	Return Plate
39	134 2 4110 11300	Gear Cycling
40	134 2 4112 00100	Rod
41	134 2 4122 10800	Trip
42	134 2 4122 11300	Trip
43	134 2 4123 12900	Return Arm
44	134 2 4123 15900	Arm
45	134 2 4208 14100	Spacer
46	134 2 5101 20501	Spring (Plate PU Fix Assy)
47	134 2 5101 20800	Spring (Return Plate)
48	134 2 5101 28600	Spring (Unit Plate)
49	134 2 4106 22100	Shaft (Return Plate)
50	134 2 4106 22100	Shaft (Gear Cycling)
*	104 3 1203 00002	Nut, Hex Head 2 3.0 ㊴－1, ㉟－1, ㊱－1, ㊾－1
*	104 3 1104 00003	Nut, Hex Head 1 4.0 ㊼－1
*	131 2 4220 10502	Ring Snap ㊲－1
*	108 3 1103 00007	Ring E 3.0 ㊳－1, ㊱－1
*	108 3 1104 00006	Ring E 4.0 ㊿－1, ㉟－1, ㊻－1
*	101 3 1103 01802	Screw, Pan Head 3.0x18 ㊿－1
A	101 3 1103 02501	Screw, Pan Head 3.0x25
*	101 3 1103 01201	Screw, Pan Head 3.0x12 ㉛－2
*	102 3 1203 00602	Screw, Pan Head Tapping 2 3.0x6 ㉜－1
*	102 3 1203 01602	Screw, Pan Head Tapping 2 3.0x16 ㊻－1
*	102 3 1203 00802	Screw, Pan Head Tapping 2 3.0x8 ㊴－1
*	102 3 2203 00601	Screw, Button Head Tapping 3.0x6 ㊶－1
*	131 2 4203 17100	Washer, Nylon 0.5t ㊶－1
*	131 2 4203 84502	Washer, PE 4.5x10x0.8 ㊳－2
*	131 2 4203 83200	Washer, Plain 3.2x8x0.5 ㊿－1, ㊶－1
*	105 3 1203 00002	Washer, Spring 3.0 ㊿－1
*	131 2 4203 83202	Washer, Plain 3.2x10x1.0 ㊿－1

NOTE: * Asterisk indicates not a service part.

PARTS LIST

Ref.No.	Parts No.	Description
TURNTABLE		
*	105 3 1203 00002	Washer, Spring 3.0 ㊾－1, ㊱－1
*	131 2 4203 83217	Washer, Plain 3.2x13x1.0 ㉟－1
*	131 2 4203 84200	Washer, Plain 4.2x12x1.0 ㊳－1
*	131 2 4203 84500	Washer, Plain 4.5x10x0.8 ㊳－1
*	131 2 4203 85200	Washer, Plain 5.2x10x0.3 ㊱－1
*	131 2 4203 86000	Washer, Plain 6.5x14x1.0 ㊳－1
51	134 2 3201 10902	Base Pick Up Assy
51-1	131 2 1407 10800	Cover Decorate
52	131 2 2904 11500	Pad Lid
53	134 2 5205 11300	Cushion
54	134 2 4108 18200	Plate
55	134 0 6017 10800	Lifter Assy
56	134 2 3308 10501	Holder Pick Up
57	134 2 4116 12500	Spindle Lifting
58	134 2 5101 27300	Spring (Spindle Lifting)
59	134 2 4213 10800	Washer Bowl
60	134 2 4123 15101	Arm (Anti Skating)
61	134 2 5101 27100	Spring (IFC Arm)
62	134 2 3310 11001	Support Arm Assy
63	134 2 3310 11002	Support Arm
64*	131 2 4201 16102	Screw M3x3
65*	131 2 4201 16300	Screw
66	134 2 1601 13801	Knob
*	108 3 1102 00000	Ring E 2.0 ㊼－1
*	102 3 1203 01002	Screw, Pan Head Tapping 2 3.0x10 ㊶－3
*	102 3 1202 60601	Screw, Pan Head Tapping 2.6x6 ㊶－1
*	102 3 1203 00802	Screw, Pan Head Tapping 2 3.0x8 ㊹－2
*	131 2 4203 83201	Washer, Plain 3.2x10x0.5 ㊼－1
*	131 2 4203 18900	Washer, Nylon 5x8x0.8t ㊻－1
67	131 2 6308 17000	Filter
68	134 0 5008 11100	Selector Speed Assy
69	134 2 1404 11000	Housing
70	134 2 1404 11100	Housing
71	134 2 1601 14300	Knob
72	134 2 1601 14800	Knob
73	134 2 2106 10900	Holder
74	134 2 4106 21800	Shaft
75	134 2 4108 18800	Plate
76	134 2 4108 20000	Plate
77	134 2 4120 16800	Reject Lever
78	134 2 5101 27200	Spring
79	134 2 5101 27400	Spring
*	104 3 1203 00002	Nut, Hex head 2 3.0 ㊾－1, ㊼－1
80	131 2 4220 10502	Ring Snap
81	131 2 4220 10503	Ring Snap
*	102 3 1203 00602	Screw, Pan Head Tapping 2 3.0x6 ㊽－2, ㊻－1, ㊸－1
*	102 3 1203 00802	Screw, Pan Head Tapping 2 3.0x8 ㊿－6
*	101 3 1103 00603	Screw, Pan Head 3.0x6 ㊼－1
*	101 3 1103 01201	Screw, Pan Head 3.0x12 ㊾－1
*	101 3 1103 01602	Screw, Pan Head 3.0x16 ㊿－1
82*	131 2 4201 18500	Screw
*	102 3 1203 01002	Screw, Pan Head Tapping 2 3.0x10 ㊸－2

Ref.No.	Parts No.	Description
TURNTABLE		
*	131 2 4203 83200	Washer, Plain 3.2x8x0.5 ㉕－1, ㊿－1, ㊼－1
*	105 3 1203 00002	Washer, Spring 3.0 ㊻－1
*	131 2 4203 83217	Washer, Plain 3.2x13x1.0 ㊿－2
83	4 2379 21500	Lug 1-4P
84	C1HYDZ103A--	Capacitor Ceramic 0.01 μF 50V +80, –20 %
85	131 0 4004 15000	Wire Shield Assy
→86	134 0 4001 05601	Tone Arm Assy
86-1	134 0 4002 10402	Arm Head Assy
86-2	134 0 4003 00901	PU Weight Assy
86-3	134 0 4004 01301	PU Arm Assy
87*	134 2 4202 11501	Nut
*	102 3 1203 00602	Screw, Pan Head Tapping 2 3.0x6 ㊸－1
88*	134 2 4203 02301	Washer
89	4 2319 21991	SW Micro (Speed Select)
90	4 2319 21993	SW Micro (Return Plate)
91	4 2439 20523	Line Cord
92	4 6129 20790	Neon Lamp
*	102 3 1203 00602	Screw, Pan Head Tapping 2 3.0x6 ㊹－5
*	102 3 1203 01002	Screw, Pan Head Tapping 2 3.0x10 ㊹－2
93	131 2 1407 10900	Cover Decorate
94	134 0 5011 00500	Motor Assy (Linear)
*	101 3 1103 01001	Screw, Pan Head 3.0x10 ⑯－2
*	104 3 1209 00001	Nut, Heax Head 9.0 ⑯－3
*	104 3 1104 00003	Nut, Hex Head 4.0 ②－3
*	131 2 4203 18800	Washer ㊹－1
*	131 2 4203 18700	Washer ㊹－1
95	4 2512 02000	Power Transformer
96	131 0 4001 81100	Motor P.C. Assy
97	131 0 4001 87400	Power Supply P.C. Assy
98(VR01)	4 2229 26050	VR 1kB (45 rpm)
99	134 2 6102 13500	Mat Turntable
100	134 2 6103 11201	Plate Decorate TT
101*	131 2 3608 12401	Cramp Wire
102 (VR02)	4 2229 27000	VR 2kB (33 rpm)
103	4 2319 21530	Switch Slide 6P
104	131 2 4108 10300	Spindle Pulley
105	134 2 5202 11800	Rubber Cushion
106	131 2 6113 28600	Shelter

NOTE: * Asterisk indicates not a service part.

SCHEMATIC DIAGRAM